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FAMILY LYCEUM.

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VOLCANOES.

STROMBOLI.

To the northward of Sicily lies a cluster of small islands, almost all of which contain volcanoes, that of Stromboli being the chief. The crater of this last is peculiarly characterised by its frequent momentary eruptions of stones, which, in consequence of its being confined on the side of a hill, are thrown back by a recoil, and relapsing into the volcano supply it afresh with endless materials. The island of this group, which is named Vulcano, has a larger crater, but its materials seem exhausted. The isle of Lipari, containing the town of the same name, presents vast rocks of volcanic glass; and it is from the hill called Campo Bianco, three miles from the town of Lipari, that Europe is chiefly supplied with pumice-stones for different purposes. Felicuda and Alicuda, the two extreme Liparian islands towards the west, display equal proofs of their having formerly contained volcanoes; and modern authors have discovered similar traces in the isle of Ischia, and in those of Penza to the north of the gulph of Naples; while that of Capri, to the south of the Neapolitan gulph, is supposed to be chiefly calcareous.

The best account of the volcanic phenomenon of Stromboli is that of Spalanzani, as follows:—

I shall now proceed to relate what I observed relative to the volcano on the night of the 1st of October. My residence was in a cottage, on the north side of the island, about half a mile from the sea, and two miles from the volcano; but so situated that the cloud of smoke round the mountain scarcely permitted me to see the top of the fiery ejections. I employed more hours of the night in making my observations, than I permitted myself for repose; and the following is a brief summary of the principal appearances I noticed.

The south-east wind blew strong. The sky, which was clear, the moon not shining, exhibited the appearance of a beautiful aurora borealis over that part of the mountain where the volcano is situated, and which, from time to time, became more red and brilliant, when the ignited stones were thrown to a greater height from the top of the mountain. The fiery showers were then more copious, and the explosions which followed them louder, the strongest resembling those of a large mine which does not succeed properly, from some cleft or vent.—Every explosion, however, slightly shook the house in which I was, and the degree of the shock was proportionate to the loudness of the sound. I do not believe that these shocks were of the nature of the earthquake; they were certainly to be ascribed to the sudden action of the fiery ejections on the air, which struck the small house in which I was, in the same manner as the discharge of a cannon will shake the windows of the neighboring houses, and sometimes the houses themselves. A proof of this is, that the fiery showers always were seen a few seconds before the shock was felt, whereas the house was so near the volcano, that, had it been a real earthquake, no interval of time would have been perceptible.

Before the morning rose, the fiery light over the volcano increased so much, at three different times, that it illuminated the whole island, and a part of the sea. This light was each time but of short duration, and the showers of ignited stones were, while it lasted, more copious than before.

On the morning of the 2d of the same month, the south-east wind blew stronger than ever, and the sea was greatly agitated. The smoke of Stromboli formed a kind of cap round the top of the mountain, which descended much lower than on the preceding day. The phænomena were the same; but the convulsions of the volcano were more violent. The explosions were very frequent, but always with a hollow sound; and the ejected ashes reached the scattered dwellings of the people of the island. In the morning, the ground appeared very plentifully sprinkled with these ashes, as they are called by the natives; but on examination, I found that they were not properly ashes, but very finely triturated scoriæ, consisting of very small grains, of no determinate form, dry, and rough to the touch, and which crumble into powder under the finger. They are not far from a vitreous nature, in color between a grey and a red, semi-transparent, and so light, that some will float on the water. Their levity proceeds from the great quantity of vesicles, or pores, which they contain, and which causes them, when viewed with the lens, to bear some resemblance to the sea production of unknown origin called savago [*favaggine.*]

The islanders assured me that these eruptions were very inconsiderable, compared with others which had formerly taken place, during which the ashes had, in a few hours, formed a covering over the ground and the houses of several inches thick; and the stones thrown out were scattered over the whole island, to the great damage of the vineyards and woods which were near the volcano, to which the flames communicated.

As the day advanced, the hope I had entertained that I should be able immediately to visit the volcanic fires of Stromboli, greatly diminished; since I must have had to pass a large tract of the mountain entirely covered with smoke, which had extended itself so widely through the air, that it darkened the whole island. I deferred, therefore, my intended journey till the next day, should that prove more favorable, and employed myself in examining the principal productions of the place.

Wherever I placed my foot, I found the whole shore, to the east and north-east, composed of a black volcanic sand. This sand is an aggregate of fragments of shoerls, as has been remarked by M. Dolomieu; but when we view it with the lens, we discover, besides the shoerls, which are entirely opake, and are attracted by the magnet, a number of small transparent and vitreous bodies, of a yellowish green tincture, and which are insensible to the magnet. I was doubtful whether these were likewise fragments of shoerls, but of a different species, or whether they were volcanic chrysolites; their extreme minuteness not permitting me to ascertain their nature by any satisfactory experiment.

This sand extends into the sea, to the distance of more than a mile from the shore; as appeared from its adhering to the sunken plummet, when it had been previously covered with tallow; probably it reaches to a still greater distance.

The sea easily penetrates through this sand—for if any part of the shore be dug into a little depth, sea water is found, but rendered somewhat more fresh by having left a part of its salts in the sand; as happens to the same water when it issues, drop by drop, through a long tube filled with sand, through which it is filtered. The fishermen of Stromboli, when they are in want of fresh water, frequently dig wells on the shore, and drink the water these afford.

This sand, as has been already said, occupies that part of the island which fronts the east and the north-east, extending on the one side to the sea, into which it stretches, and on the other to the summit of the mountain. It owes its origin partly to the immediate ejections of it by the volcano, and partly to the pieces of scoriaceous lava thrown out by the same, which being, as has been said, extremely friable, and greatly abounding in shoerls, easily decompose and become pulverized in this sandy matter. In fact, nothing is more usual than to find in it fragments of this scoriaceous lava of various sizes.—This sand is found principally near the volcano, where both it, and the scoriaceous lavas from which it is formed, fall in the greatest quantities; but as, from its fineness, it is easily moveable, it is carried by the wind to the valleys and lower grounds quite to the sea.

This, however, is only the thin upper coating of those parts of Stromboli which it covers, as under it lies the firm texture of the island; I mean the solid lavas, which are visible on several steep descents, that have been stripped of the sand, either by the action of the rain-water, or that of the winds.

On the same day I made the circuit of a great part of the base of the island, which is about nine miles in circumference, and found the same solid constructure; a small tract of tufa, on the north side, excepted, which descends to the sea.

In this excursion, I carefully examined the course and direction of the lavas, and was convinced that they all had flowed from the steepest summit of the mountain, under different angles of inclination, passing one over another, and thus forming a succession of crusts, or strata, like, in some measure, the coatings of which an onion consists.—In several places where the lava has entered the sea, these crusts may be seen lying one over the other, some of them broken or separated by the shock of the waves.

These facts strongly induced me to suspect that the crater of Stromboli had anciently been situated on the summit of the mountain, and that the lavas which had principally contributed to the production of the island had flowed from that crater.

The following night I returned to the same place, persuaded that I should see new objects to excite my admiration; and in fact, the scene I beheld, appeared to me as delightful and astonishing, as it was noble and majestic. The volcano raged with more violent eruptions, and rapidly hurled to a great height thousands of red hot stones, forming diverging rays in the air. Those which fell upon the precipice, and rolled down it, produced a hail of streaming fire, which illuminated and embellished the steep descent, and diffused itself around through a considerable space.

But, independent of these ignited stones, I remarked a vivid light in the air, which hovered over the volcano, and was not diminished when that was at rest. It was not properly flame, but real light reverberated by the atmosphere, impregnated by extraneous particles, and especially by the ascending smoke. Besides varying in its intensity, it appeared constantly in motion, ascended, descended, dilated, and contracted, but constantly continued fixed to one place, that is, over the mouth of the volcano; and clearly shewed that it was caused by the conflagration within the crater.

The detonations, in the greater eruptions, resembled the distant roar of thunder; in the more moderate, the explosion of a mine; and, in the least, they were scarcely audible. Every detonation was some seconds later than the ejection. This, likewise, was observable by day.

I remained that night two hours on the water at this place, and the eruptions were so frequent, and with such short intermissions, that they might be said to be continual.

During both these visits, thick showers of sand and fine scoriæ fell into the sea, and falling on my hat, which was of oil-cloth, made a noise like a small hail.

The five sailors who had the care of the boat in which I was, and some other natives of Stromboli who were with me, and whose occupation frequently brought them to that part of the sea, told me that the volcano might now be considered as very quiet; assuring me, that, in its greater fits of fury, red hot stones were thrown to the distance of a mile from the shore, and that, consequently, at such times, it was impossible to remain with a boat so near the mountain as we then were. Their assertion appeared to me sufficiently proved by a comparison of the size of the fragments thrown out in the explosions I now witnessed, with that of those which had been ejected in several former eruptions. The first (many of which had been stopped at the bottom of the precipice by other pieces of lava, and were scoriaceous lavas, approaching to a globose form) were not more than three feet in diameter; but many of the fragments thrown out at other times, of similar quality to them, and which lay in large heaps on the shore, were some four, some five feet in diameter, and others even still larger.

To be continued.

PAPER MILL.

On the rivulet which runs through Dover, is a paper-mill, and a corn or flour-mill.—The latter, as usual in England, is deficient in the labor-saving machinery in which consists the superiority of the modern American flour-mills. The former appeared also to be managed on the old system of paper-making. The rags, after being torn to pieces by machinery, are macerated in water, until reduced to a pulpy mass of the consistence of a broth or porridge. In this semi-fluid state, it is dipped up in sieves of the form or dimensions of the sheet of paper to be made. The pulp, after being drained, becomes sufficiently consistent and cohesive to form thin spongy flakes, which are laid between blankets and subjected to a pressure, by which means they become sufficiently consolidated to bear handling.

The modern improvement of making a continuous unbroken sheet, a mile or more in length, if desired, by means of a revolving cylinder covered with the same sort of wire as previously used for the bottom of the sieve, is not as yet universally adopted in England. A continuous sheet is obtained from this cylinder by adjusting it to one end of the cistern filled with the pulpy mass, and causing it to revolve slowly. The current of water passing off through the meshes of the wires, leaves the fibrous particles of the pulp lodged against the surface of the cylinder, from which, whilst revolving, it is detached and drawn off to form a perpetual sheet. The water which escapes from the cistern would soon exhaust it, were not pumps employed to restore it, by which means the operation may be continued without intermission.

It was a church holiday on the morning of our visit, and the workmen were all absent, 'merry Whitsuntide being come,'—a festival so called by the primitive church, from the appearance in public on that day of all those who had been made converts during the past year. They were dressed in white garments on this festival occasion. From this circumstance, the term Whitsuntide was derived, being compounded of white, Sunday, and tide or time. Like most religious festivals, however, it has degenerated into a mere holiday, and an occasion for drinking and carousals. The workmen, the proprietor observed, were probably about the alehouse. He also observed, that the manufacture of paper in England passed the zenith of its prosperity when the American colonies, now the United States, became separated from England, in consequence of the injudicious measures of the English ministry. —[*Practical Tourist.*

NATIONAL CABINET.

THE prospects for a National Cabinet of minerals, and other specimens of natural and artificial productions, are most encouraging; they are even certain. The materials are already collected in great abundance, and only need to be applied to their appropriate use. Several thousand valuable cabinets now exist in our country; and they are in such hands as would gladly enter into a system of exchanges.

It is evident there is no medium by which exchanges can be carried on through the Union with one half the facility or success as by the AMERICAN LYCEUM, in all its departments of National, State, County, and Town Societies. How easy it would be for the individuals of any town Lyceum to procure a cabinet for their use. And when town Lyceums were furnished, a county deposit might be made in a single day, at a semi-annual or quarterly meeting, when the specimens might not only be deposited, but named and used for the benefit of all who should attend.

From county cabinets state collections might be readily formed, aided, as they would be, by cabinets of towns and individuals.—And from the various cabinets in the states a national collection might be made at New York, at the anniversary of the American Lyceum, and at Washington by members of Congress, and by other Americans and many foreigners who visit the place, officially, or for other purposes.

Let these various cabinets be once commenced, and they must grow of course, and that too by the best possible means; by a friendly interchange among differents parts and different departments of our nation.—The results of such a system of exchanges—of friendly cooperation for the diffusion of useful and practical knowledge, must be national in the strictest and highest sense of the word. And no one would suspect it of nullification.

MEAN TEMPERATURE OF ALBANY.—From meteorological observations made at Albany, in the state of New York, during 17 years, it appears that the mean temperature of that place is 40° 04. The highest point of the thermometer during this period, was in 1820, and was 100°; the lowest was in 1796, and was 20°. During 15 years there has been an annual average of 2000 fair days.

Galvanism.

This surprising branch of philosophy has been denominated Galvanism, from Galvani, an Italian professor, whose experiments led to its discovery.

In 1789, some time before he made the most important discovery, he was by accident led to the fact, of electricity having the property of exciting contractions in the muscles of animals. Stimulated by the then prevailing idea of electricity being a principle inherent in animals, which, acting upon the muscular susceptibility, was the immediate cause of muscular motion, he was induced to persevere in the inquiry, during the prosecution of which he brought to light other facts, which laid the foundation of this valuable scientific acquisition.

After having observed that common electricity, even that of lightning, produced vivid convulsions in the limbs of recently killed animals, he ascertained that metallic substances, by mere contact, under particular circumstances, excited similar commotions.

He found, that it was essential that the forces of metals employed should be of different kinds. He applied one piece of metal to the nerve of the part, and the other to the muscle, and afterwards connected the metals, either by bringing them together, or by connecting them by an arch of a metallic substance; every time this connection was formed the convulsions took place.—The diversity in the metals employed in these experiments appeared, in the very early stages of this inquiry, to be connected with their respective degrees of oxydability, the one being possessed of that property in a great degree, and the other little liable to the change. Hence zinc, and silver or gold, was found to produce the greatest muscular contractions.

The experiments of Galvani were confirmed by many able philosophers, by whom they were repeated. Those who particularly distinguished themselves by their labors on the subject were, Valli, Volta, Drs. Monro and Fowler.

As silver and zinc had been found in the minor experiments to produce the greatest effect, these metals were employed by Volta in the construction of his battery. The silver plates generally consisted of coins; and the zinc plates were of the same size, being frequently cast in moulds made with the silver. The same number of pieces of cloth, pasteboard, or leather, of the same size, and steeped in solution of common salt, were also provided. The above substances were formed into a pile, in the following order, zinc, silver, wet cloth, zinc, silver, wet cloth; and so on, in the same order, till the pile became sufficiently high. If it were to be elevated to any considerable height, it was usual to support it on the sides with three pillars of glass, or varnished wood.

The pile, thus formed, was found to unite the effects of as many pairs of plates as might be employed. Previously to this no other effect had been produced than what resulted from the energy of a single pair of plates. A pile of 50 pairs of plates, with as many corresponding pieces of wet cloth, was found to give a pretty smart shock, similar to an electric shock, every time that a communication was made between the top and bottom of the pile. It was found, however, that little or no shock was perceived, when the hands, or other parts applied, were not previously moistened. It was also observed, that the effect was increased when a larger surface was exposed to the action of the pile. If the communication were made by touching the pile with the tip of each finger merely, the effect was not perceived beyond the joint of the knuckle; but if a spoon, or other metallic substance, were grasped in moistened hands, the effect was felt up to the shoulder. If the communication be formed between any part of the face, particularly near the eyes, and another part of the body, a vivid flash of light is perceived before the eyes, corresponding with the shock. This phenomenon may be more faintly observed, by placing a piece of silver, as a shilling, between the upper lip and the gum, and laying a piece of zinc at the same time upon the tongue; upon bringing the two metals in contact, a faint flash of light is perceived. It is singular, that this light is equally vivid in the dark with the strongest light, and whether the eyes be shut or open.

The most striking and the most common experiments are those which consist in the galvanic energy upon the organs of animals. If two metallic rods, or, what is equally convenient, two silver spoons, be grasped, one in each hand, the skin of the part being previously moistened with a solution of salt, and one of the spoons be brought in contact with one end of the battery, the moment the other comes in contact with the other end of the battery, the shock is perceived. Fifty compound plates will give a shock which will be felt in the elbows; one of a hundred will be felt in the shoulders; a greater number of plates give so forcible a shock to the muscles, as to be dreaded a second time. The shock appears to depend upon the number of plates. The stun, or first impression, is much the same, whatever may be the size of the plates; at least, from the size of two inches square to that of ten, the surfaces being as four to one hundred. The effect upon the muscles, as well as upon the cuticle itself, is very different from large plates, when the series is the same.—It appears, that the shock, or first impression, is as the series, which is also as the intensity of the electricity. If the shock be received from the same number of large plates, the same species of commotion is produced in the first instance, as with the small plates; but if the contact be still kept up, a continuation of the effect is perceived, which is felt through the whole arms, producing a vast tremor, attended with a sensation of warmth. If the plates be from eight to twelve inches square, this effect may be perpetually kept, while the acids in the cells are expended.

Though small plates have been recommended for medical purposes, we think large ones will be found more likely to have a good effect. If the medical advantage is derived from the stimulus of galvanism, the effect of a perpetual and regular current of that stimulus must certainly be preferable to the rapid transmission of a small quantity.

The galvanic shock may also be conveniently given, by immersing the hands or the feet into vessels containing a solution of salt, and bringing wires from each end of the battery into the liquid. If any other part of the body is intended to be operated upon, a sponge moistened with salt water, fastened to a metal plate connected with one end of the battery, may be applied to the part, and a hand or foot put into a vessel of the same liquid, connected by a wire with the other end of the battery. Small bits of sponge, or bits of leather, may be fastened to the end of the connecting wires, and made more or less moist, as the delicacy of the part may require. This contrivance is very useful in operating upon the eyes or ears.

When galvanism is used medically, it should first be applied very feebly, and the effect gradually increased, as the susceptibility of the part will admit. If the part has, from disease, become so languid and insusceptible, as not to be sensible of the effect, it should be scarified, or by other means have the cuticle removed. This is sometimes the case with languid tumours, and some cases of paralysis. Though we had no great opinion of the medical agency of galvanism, we have lately heard of several very successful cases; one of which, in particular, was the cure of perfect loss of speech. If the naked metal of the wire, from a powerful battery, be applied to the skin, it becomes cauterized and blistered.

If the plate, covered with a moistened sponge, connected with one end of the battery, be applied to the back of the head, at the same time that the moistened fingers of one hand are slightly applied to the other end, a smarting sensation will be felt in the part, and a taste at the same time will be felt in the mouth, similar, but in a greater degree, to that occasioned by the piece of zinc, and the shilling, when laid upon the tongue. This experiment succeeds the best with a small number of large plates, as much as ten inches square.—[*The Book of Knowledge.*

Anecdote of Benjamin Franklin.

Not long after Benjamin Franklin had commenced editor of a newspaper, he noticed with considerable freedom the public conduct of one or two influential persons in Philadelphia. This circumstance was regarded by some of his patrons with disapprobation, and induced one of them to convey to Franklin the opinion of his friends with regard to it. The Doctor listened with patience to the reproof, and begged the favor of his friend's company at supper, on an evening which he named; at the same time requesting that the other gentlemen who were dissatisfied with him should attend. The Doctor received his guests cordially,—his editorial conduct was canvassed, and some advice given. Supper was at last announced, and the guests invited to an adjoining room. The table was only supplied with two puddings, and a stone pitcher filled with water. All were helped, none could eat but the Doctor. He partook freely of the pudding, and urged his friends to do the same; but it was out of the question—they tasted and tried in vain. When their host saw the difficulty was unconquerable, he rose, and addressed them: 'My friends, any one who can subsist upon saw-dust pudding and water, as I can, needs no man's patronage.—[*Watson.*

METEOROLOGY.

Rain.

From observations made at 147 different places upon the earth, it is found the mean quantity of rain which falls in a year is 34,7 inches in depth. The quantity is greatest at the equator, and diminishes gradually as we advance towards the poles.

	Lat. N.	Inches.
Thus at Grenada,	12°	126
Cape Francois,	19 47′	129
Calcutta,	22 23	81
Rome,	41 54	39
England,	50 a 53	31
Petersburg,	59 6	16
Uleaburg,	65 1	13 1-2

The comparative number of rainy days is in the reverse order thus; from latitude 12° to 43° the mean number of rainy days annually is 78

From 43 to 46	103
" 46 to 50	134
" 50 to 60	161

These facts prove that the rains are most heavy at the equator, as the rainy days are fewest there, and the quantity greatest.

From tables collected from various places in England, results are thus:

Maritime places.		Inches.
Keswick,	7 years,	67 5
Lancaster,	10 "	45
Liverpool,	18 "	34 4
Bristol,	3 "	29 2
Plymouth,	2 "	46 5
Garsdale,	3 "	52 3
Inland places.		
London,	7 "	23 0
S. Lambeth,	9 "	22 7
D'byshire,	15 "	27 8
Lyndon,	21 "	24 3
In London, seven years.		
1774,		23 3
1775,		24
1776,		20 3
1777,		25 3
1778,		20 7
1779,		26 7
1780,		17 3

For different months in 1708.

	Pisa.	*Upminster.*	*Zurich.*
January,	6 41	2 88	1 64
February,	3 28	46	1 65
March,	2 65	2 03	1 55
April,	1 25	96	4 69
May,	3 33	2 02	1 91
June,	4 90	2 32	5 01
July,	0 00	1 11	3 50
August,	2 27	2 94	3 15
September,	7 21	1 46	3 02
October,	5 33	0 23	2 44
November,	13	86	0 62
December,	0 00	1 07	2 62
	36 76	19 24	32 66

Composition of Organized Structures.

Notwithstanding the perplexing diversity of form which vegetable substances assume, experiments have proved that they are all composed of the same ultimate materials, and these very few in number. We may select any vegetable structure as the representative of all the rest: and, by examining others in the same manner, it will be found that they present the same results. The method by which the component elements are separated is simple; the vegetable is merely exposed to the action of fire: not an open fire, for in this way all its parts would be dissipated or burned away; but in a vessel calculated to retain its principles in such a manner as to permit their being brought under examination. Green wood will be a good instance. Take a common gun-barrel, the touch-hole of which is stopped; push a small cylinder of green wood down to the breach, and place that end horizontally in a good coal fire. As the wood is heated, the water, which is the chief ingredient of its juices, distils over, and drops from the open end of the tube. In proportion as the water distils, from being insipid, it becomes sour. Shortly, after, a gas issues out of the tube, and may be collected by tying a moist bladder, the common air being well pressed out of it, round the mouth of the tube. If, when the gas ceases to issue, the contents of the tube be examined, the piece of wood will be found altered into a black, dry, light, sonorous mass, retaining, however, its texture, though much reduced in size. It is, in short, converted into charcoal, or, in chemical language, carbon; and, if its weight be added to that of the gas, the mere water, and the sour water, the result will be the original weight of the wood without loss; hence these are all the ingredients which composed the wood. As a general summing up, we may recapitulate, that from wood we obtain hydrogen, carburetted hydrogen, bicarburetted hydrogen, carbonic oxide, carbonic acid, ascetic acid, holding tar, ammonia, and charcoal. By multiplying experiments on other vegetable structures, we learn, that all of them, however complicated when made to undergo the ordeal of heat in confined vessels, resolve themselves, like wood, into the four elements, oxygen, hydrogen, carbon, and azote; the latter being in such small quantity as to be barely discoverable. These, again, by combining amongst themselves, produce the compounds above described, but the four ingredients mentioned are what are called the ultimate elements of all vegetable matter, notwithstanding its apparent diversity. A striking proof of the extraordinary differences of appearance which the same body may assume, and also of the intrinsic worthlessness of some of those objects on which society sets the highest value, occurs in the instance of the substance under consideration. Every one knows the enormous price at which diamonds of good quality and size are estimated. The celebrated regent diamond, which was set in the handle of the late Emperor Napoleon's sword of state, is now valued at £260,000, although only 1 1-8 ounce, and was originally purchased for £20,400 by Thomas Pitt, grandfather of the great Earl of Chatham, while governor of Madras. Yet this precious ornament is neither more nor less than a piece of charcoal; and, surprising as it may appear to those hitherto unacquainted with the fact, it is well proved by numerous experiments, that between the diamond and charcoal there is almost no difference of composition; the diamond burns in oxygen with brilliant flame, and, like charcoal, forms carbonic acid; like charcoal, it forms steel by combination with iron; and the difference between the two bodies seems to be chiefly in their state of aggregation, the diamond being harder and crystallized; it is also a little purer in composition. The pure portion of charcoal is distinguished among chemists by the name of carbon.

Having acquired some acquaintance with the vast variety of form under which the objects constituting the vegetable world appear and the simplicity of their composition, the next subject of contemplation is the animated part of the creation,—the most interesting and stupendous of all. How much more admirable and surprising must the structure of a living animal appear, when it is known that it is composed of but a few elements, such as have been formerly described: little more than the meanest vegetable, and fewer than many minerals. The materials of which animals are composed being nearly the same, as those which compose plants, the difference is in their relative quantity, and in the mode of combination. The combustible substance, phosphorus, has been detected, in small quantity, in some vegetables, as in the onion; but it exists in large quantities in the bones of animals: not in the state of phosphorus, as commonly seen, but disguised by combination with oxygen in the state of an acid, and this acid combined with lime. The bones of animals, then, consist chiefly of lime and phosphoric acid; at least these ingredients compose their earthly basis, as it is called; but it is impregnated with animal matter that adds greatly to their strength, toughness, and solidity. The other element which exists largely in animal matter is azote: it is also a constituent part of several kinds of vegetable matter; and it is singular, that the same azote, which adds so much to the nutritiousness and flavor of animal food, renders vegetable matter disgusting to the taste, and poisonous. The chief substances, then, which enter largely into animal matter, are oxygen, hydrogen, azote, carbon, phosphorus, and lime. We find some other kinds of matter, as certain acids and metals, but in quantity so small as not to affect the truth of the above statement, that the foregoing six ingredients constitute the great bulk of the animal fabric.—[*Railroad Journal.*

Public Schools in Philadelphia.

The Annual Report of the Controllers of the public schools of the city and county of Philadelphia states that 2567 boys and 2230 girls are in the schools in the city and Liberties; that upwards of 45,000 children have been admitted since the organization of the present system, (1818,) and every facility for acquiring the useful and practical parts of a good education liberally imparted to them. They have erected, during the last year, 3 substantial brick school-houses—1 on Race west Broad street; 1 in Kensington; and the last in Moyamensing; and made arrangements for the erection of another this year near the corner of Front and Pine streets. The expense of maintaining these schools is $21,000, besides $23,000 paid for the erection of new buildings, and the purchase of ground.—[*World.*

MISCELLANEOUS, RURAL, AND SCIENTIFIC GLEANINGS.

Composition of the Atmosphere.—Nitrogen and oxygen, with a small portion of carbonic acid gas, are the constituents forming the atmosphere. The two former are considered not to vary in their proportions. The proportions of the latter depend on temperature, winds, rains, and atmospherical pressure. At Geneva, according to the experiments of Saussure, the mean quantity of this gas in 1000 parts of air by measure is at mid-day 4. 9, the minimum 3. 7, and the maximum 6. 2. He observes, that in Switzerland this gas increases in summer, and decreases in autumn—that at noon the quantity in December, January and February, is to that in June, July and August, as 77 to 100. Over wet soils the atmosphere contains less than over dry ones—more in the night than in the day time—less in the lower strata of the air than in the higher. Winds are considered to increase the quantity in the strata near the earth, by mixing that of the upper strata. The cause why there is less over wet soils is, probably, that fermentation is checked by excess of moisture. Plants give out carbonic acid gas in the night, and thus increase the quantity.

Northern and Southern Aspect.—On the northern declivity of the Himmalah mountains, at the height of 15,000 feet, Capt. Gerrard found the hills and vallies covered with vegetation and herds of deer, and flocks of pigeons. On the southern declivity, at 10,000 feet, was the extreme height of cultivation. This difference is supposed to be owing to the radiation of caloric from the table land of Thibet; the dryness of the air in Central and Northern Asia, the small quantity of snow, and the serenity and transparency of the atmosphere, facilitating radiation.

Dew collected from the leaves of plants contains more carbonic acid gas than that from other substances. The gas given out in the night must be absorbed by the dew.

The Romans.—Pliny asserts that the Roman citizens, in early times, ploughed their fields with the same diligence that they pitched camps, and sowed their grain with the same care that they formed their armies for battle.

Planting and Building.—Cato says, 'a landholder should apply himself to the planting of his fields early in his youth, but he ought to think long before he builds.'

Planting in Scotland.—Sir Walter Scott's History of Scotland contains the following: In 1504, there was made 'a series of regulations for the improvement of rural economy, which imposes a heavier mulct than before on the destroyers of wood, the forests of Scotland being, as was alleged, utterly destroyed. For the same reason, every inheritor is directed to plant at least an acre of wood, to form parks and inclosures, construct fish-ponds, stock rabbit-warrens and dove-cotes, and plant orchards.'

The Horse.—This noble animal appears to find a congenial climate wherever the air is pure. It is remarked that a low and marshy soil, in all countries, is uncongenial to him, and that he rapidly degenerates.

Sinking Wells.—Bishop Heber mentions a curious way of sinking wells in some parts of Asia. When the ground is sandy, a cylindrical tower of brick or stone work is made of the intended size of the well. This is suffered to remain until the masonry becomes indurated, and then it is gradually undermined until it is sunk even with the surface of the ground. If the well is not sufficiently deep, they add more masonry, and again undermine.

Salt in India.—The soil of Hindostan is so much impregnated with salt, that a saline effervescence is seen in almost every low spot.

Mud in Rivers.—The weight of mud daily carried down the river Ganges is calculated at 74 times the weight of the great pyramid of Egypt.

Saltpetre in India.—Bishop Heber observes that the tendency of the soil in Bengal to produce saltpetre is so great, that it encroaches upon walls and floors of the houses to an extent often rendering them uninhabitable in a few years. The saltpetre corrodes the best of bricks, and crumbles them.—[*Railroad Journal.*

GLASS.—The value of the glass annually produced in Great Britain is estimated at £2,060,000; and the workmen employed in the different departments of the manufacture exceed 50,000.

LESSONS ON SHELLS.—A very excellent and instructive little work, under the above title, designed chiefly for children, and illustrated by plates drawn from nature, has been just published at New York. They are by the author of 'Lessons on Objects,' who originally gave these *lessons* in a Pestalozzian school.—[*Rd. Jl.*

LYCEUMS OF BOSTON.

In Boston there are not less than fifteen institutions, with more or less of the nature and objects of Lyceums. The Mechanics' Association, which is the oldest institution of the kind in the city, has, as every Lyceum ought to have, benevolence for a part of its object. Besides the distribution of charity, it has had for several years, a weekly course of lectures during the winter, which for the last season, have been numerously attended by ladies as well as gentlemen. According to the constitution of this association, the members must be master mechanics.

The Mechanics' Institution has been in operation five or six years, and is furnished with a valuable set of apparatus at an expense of two or three thousand dollars. Since its organization, a course of lectures has been given annually, by gentlemen of extensive attainments in science and literature. To the lectures during the last season, ladies have been invited.

The Society for the Diffusion of Useful knowledge has been organized about four years. Since which time, they have had an annual course of lectures on various subjects, which have been numerously attended. Several volumes have been published under the patronage of this society, entitled, The American Library of Useful Knowledge.

A Society for Natural History was organized about two years since, and have had three courses of lectures on the different departments of Natural History, highly acceptable to the auditors and spectators. This society is in a prosperous condition, and is soon to be furnished with commodious rooms for depositing their collections.

The Franklin lectures have been given for two seasons, and very numerously attended.

The Young Men's Association for the promotion of Literature and Science, though smaller in number than those already mentioned, is not less profitable or interesting to its members.

The Young Men's Benevolent Society unites literary improvement with aiding the poor, which is its principle object. It has been highly useful and is now in a state of increasing prosperity.

The Boston Young Men's Society for intellectual and moral improvement, which was organized but a few months since, has procured a respectable library and a commodious Hall, and other rooms, where young men, especially strangers, are invited to resort, and where they are placed under the most favorable circumstances for social entertainment, by forming valuable acquaintances and enjoying good society, while they have great facilities for intellectual improvement.

The Boston Lyceum has had increasing prosperity since its first organization, four years since. It is distinguished from most or all the societies already named, by its being divided into various classes, for special objects, such as Natural Philosophy, Astronomy, Mathematics, Elocution, French language, &c. It is also distinguished by their applying to none, or but a few, except the members of the society, for public lectures, which have been highly respectable, and given for four seasons.

The Mechanics' Lyceum, though from its object and constitution it is not large, has been highly successful in bringing forward young men, to feel and exert their own powers, which has, of course, resulted in the true elevation of character, of most if not all its members. The plan of this Lyceum is to have all the members take a part in its exercises.

Among other results of the Mechanics' Lyceum, is a periodical, under the name of the Young Mechanic, which is eminently of a practical and useful character, and has a growing patronage and popularity.

Another Society which is not less deserving, or prosperous than either of those already mentioned, is the Mechanic Apprentices' Library Association. This society was originally connected with the Mechanics' Charitable Association, the one first mentioned. But for a year or two past it has been independent of its parent, and has set up business for itself, and has found by its greatly increased prosperity, that it is quite competent to carrying it on. Besides the library, which is large, it has some apparatus, and has recently commenced a cabinet of natural and artificial productions.

A weekly course of lectures by the apprentices themselves, is well sustained, and sufficiently interesting and attractive to draw full meetings of ladies and gentlemen. This society has classes, especially for the younger members to become acquainted with the common and practical branches of education. It is particularly worthy of remark, that since meetings for lectures and study have been held, a greatly extended and increased interest has been given to the library. Books of a certain class which before were scarcely taken from their shelves from one year to another, have now become the most interesting as well as the most useful in the library. At a late anniversary of this apprentices' Lyceum, an orator and a poet, both from their number, furnished an entertainment to a crowded Hall of ladies and gentlemen, which would have done credit to older heads and more regularly trained scholars. This society has set an example worthy to be followed by any Lyceum in any place. Many Lyceums of a social character have been fraught with advantages of the highest value.

Social Lyceums. It may well be doubted if the social, the intellectual, the refined, the amiable and the moral faculties of our nature have ever been more beautifully blended, or more happily exhibited, than in some small circles of ladies and gentlemen, associated for the double purpose of social intercourse and intellectual improvement. Free from the empty ceremony and the heartless compliments of fashionable parties, and the restraint and formality of large assemblies, they enjoy all the advantages of the one, without the evils of the other. They are sufficiently free and unrestrained to be social and animated, and sufficiently formal to confine the conversation within certain limits, and to render it in the highest degree entertaining and instructive.

ANCIENT GRECIAN MUSIC.

IT should be remembered, that all the Greek poets were musicians, and adapted airs to their own pieces.

Amongst the musicians of this period, Timotheus (who added three strings to the lyre,) Phrynis, Antigenidas, Philoxenus, Arion, Doirion, Ismenias, Telephanes, and Lamia, (a female flute player) are the principal. Many of these performers were greatly caressed; and the science became to be considered an essential part of general education throughout Greece, particularly about the time of Pericles and Socrates.—Of musical instruments, the flute appears to have been the favorite. It was considered capable of stimulating the passions in the greatest degree; and the Lacedemonians had a song which said, that 'a good performer on the flute would make a man brave every danger, and face even iron itself.'—They played an air called *Adonion*, on the flutes called *Tibiæ Embateriæ*, (flutes to march to) when on the point of attacking an enemy. Immense prices were given for flutes. We are told that Ismenias, the celebrated musician of Thebes, gave three talents, or £581 6*s.* for one at Corinth; and that Theodorus, a flute-maker of Athens, made so much by his profession as to be enabled to give all his children a liberal education, and to bear one of the heaviest burdens to which a citizen of that city was liable, viz. that of furnishing a choir, or chorus, for his tribe, or ward, at festivals and religious ceremonies. Xenophon tells us, that flute players lived in a most magnificent manner; and their attendance at festivals and funerals was universally required. It may be remarked, that the pay of all public performers appears to have been enormous. Athenæus relates, that Amœbœus, the harper, received one talent, or £193 15*s.* for one performance at the theatre.

Next to the flute, the lyre held the principal rank in the musical instruments of Greece. Its history, as far as it is known, has already been given; and it may be remarked, that, in all probability, the various claims set up for the Muses, Linus, Orpheus, Amphion, Terpander, Pythagoras, and Timotheus, as improvers of the lyre, by increasing its compass, and augmenting the number of the strings, are each correct; for the same improvements might be suggested to the mind of different persons unconnected with each other, and adopted by them in perfect ignorance of any one having preceded them in the path of discovery. The knowledge of new inventions did not then travel so fast as in the present day; and the intercourse between different places was not carried on with that regularity and precision which is the boast of modern times.

PULSATION.—The pulse, in the time of Hippocrates, was probably not more than 60 beats in a minute, from which, probably, originates our smallest division of time, denominated the moment, or second, which divides the day into 86,400 parts. As the human species refine, probably the pulse quickens; and so completely are we machines, that, like a clock, the faster we go the sooner we are down.—[*Rd. Jl.*

HARMONY OF THE SPHERES—A sort of music much talked of by many of the ancient philosophers and fathers, and supposed to be produced by the sweetly-tuned motions of the stars and planets. This harmony they attributed to the various proportionate impressions of the heavenly globes upon one another, at proper intervals.

SCHOOL AGENT SOCIETY.

THE Committee of Arrangements, at the Teachers' Convention at Andover, have reported the following subjects for consideration at the meetings. 1. Cooperation of Schools. 2. Systematic Benevolence as a branch of common school education. 3. Circuit Schools. 4. Teachers' Lyceums for towns and counties. 5. The best mode of securing the influence and aid of ladies in the cause of education.

COMETS.

COMETS are supposed to be solid opaque bodies of various magnitudes, with long transparent tails resembling a pale flame, and issuing from the part of the comet farthest from the sun. They move round the sun in very elliptic orbits, and cross the orbits of the planets in all directions. From the curved direction of their paths, Newton concludes, that when they disappear they go much beyond the orbit of Jupiter; and that, in their perihelion, they frequently descend within the orbits of Mars and the inferior planets. He computed the heat of the comet which appeared in 1680, when nearest the sun, to be 2000 times hotter than red hot iron, and that it must retain its heat until it comes round again, even if its period should be more than 20,000 years, and it is computed to be only 575.

BISHOP MAC DONELL.—When Bishop Mac Donell first came to Upper Canada, there were only two Roman Catholic churches, and two Catholic priests in the Province; there are now thirty churches; and eighteen Priests, twelve of them educated principally by Mr. Mac Donell. Since that time the Bishop has expended out of his own revenues, for building churches, 5,000*l*; for boarding, clothing, and educating students and ecclesiastics, 1820*l*; for erecting Presbyteries and School-houses, 2,170*l*; paid to schoolmasters, (over and above the government allowance), 1,300*l*; in all 10,290*l*. Bishop Mac Donell has travelled regularly, summer and winter, from the Lower Province line to Lake Superior, at his own expense, without ever demanding or receiving a dollar from a single Catholic in the Province—sometimes obliged to go on foot, carrying his vestments on his back, in order to afford the consolations of religion to the scattered population of new settlements.—Since his residence in York, he has never omitted to celebrate Mass on every day in the week, and kept at his own expense, a great part of the time, a Priest and Ecclesiastic, to visit the sick and bury the dead.—[*Freeman.*

INFANT ASYLUMS.—It is deserving of attention, that, independently of schools for the elementary instruction of children above the age of six years, in the duchy of Saxe Weimar, every village contains a district asylum for the reception of children below that age, who have hitherto been left without any superintendance at home, whilst their parents were absent at their work. This abandonment has been, and notoriously is, the prolific source of idle and vagabond habits, which it is extremely difficult to eradicate in after years. The asylums in question have, therefore, been open for the purpose of remedying this crying evil; the parents send their children to them in the morning, and fetch them home in the evening. In the interim they are fed and taken care of, besides being taught to read and say their prayers. There is not a single village in the whole grand-duchy, which is not provided with one of these excellent 'Asylum Schools,' as they are termed; and they are rapidly spreading all over Germany.—[*Quarterly Journal.*

CANAL OF GOTHA.—This canal, one of the greatest undertakings of Europe, has just been completed. It traverses Sweden in all its breadth, from Gottenburg on the Cattegat to Soderkoping on the Baltic, and has been executed at an expense of 10,000,000 of rix dollars. In joining the two seas, the Canal of Gotha opens to trade a shorter and safer passage to the Baltic than that of the Sound, which obliges vessels to double the southern coast of Sweden. By the canal, on the other hand, the navigation is all inland, and therefore more commodious and secure.—But a main question to trade rises on this point regarding the expense. The opening of the Sound has been made by nature, the passage by the canal has been formed at a great expenditure of human labor. Duties to indemnify for its cost, it might be supposed, would be levied on the latter from which the former is exempt; but this is not the case, the tolls on the canal being somewhat less than the Sound duties.

In addition to this saving in duties by the canal, we need not observe that the diminished risk to the shipping will allow a saving in the premiums of insurance. These considerations cannot escape the attention of ship-owners and merchants.—[*London Times.*

BOOK OF NATURE.

THE SOLAR SYSTEM.

'Observe how regular the planets run,
In stated times their courses round the sun:
Different their bulk, their distance, their career,
And different much the compass of their year,
Yet all the same eternal laws obey,
While GOD's unerring finger points the way.'

FROM the consideration, that, by the laws of nature, all the lesser heavenly bodies are made to revolve round the greater, in the same manner that the moon is made to move round the earth, it was to be expected, that the Sun, the centre of a system in which so many planetary and cometary bodies were made to move within the sphere, or verge, of his attraction, would be a body of very considerable magnitude; and that he is said to be to such an extent, that his solid bulk is computed to be sixty-four millions of times larger than the moon, a million of times larger than the earth, or five hundred times larger than all the other planets put together!

From what we ourselves experience of the benefits of this luminary, we have reason to conclude, that the sun is placed in the most convenient situation in the heavens, and at the most suitable distance from each of the respective bodies which move around him; and that however nigh or remote their courses may be to the common centre, or however slow or rapid in their movements, the inhabitants of those bodies *which are inhabited*, will have forms and powers no less suited to their situations than ours,

'And constitutions fitted for that spot,
Where Providence, all-wise, has fixed their lot.'

The Sun, although generally considered as fixed, is known by his spots to make a revolution on his axis, in somewhat less than our month, and is likewise said to be agitated by a small motion round what is called the centre of gravity of the Solar System. His motion, however, is so comparatively small, that he may indeed be said to be fixed, with respect to

THE PLANETS.

Of the planets which have yet been discovered, the first, or nighest the sun, is *Mercury*. His diameter is computed to be less than the half of that of the earth, and his year is not quite so long as three of our months: the light and heat of this planet are supposed to be about seven times greater than the earth receives, yet he is said to move at the rate of more than 109,000 miles in an hour! Being so nigh the sun, Mercury is seldom seen; but when he is, it is a little after sunset, and before sunrise, and he appears to emit a bright white light.

The diameter of *Venus* is somewhat less than that of the earth, and her year is not quite eight of our months. In the heavens she moves next in order to Mercury, and notwithstanding she is supposed to be surrounded by an atmosphere like the Earth, her light and heat are said to be twice as much as ours. Like the Sun, this brilliant planet has her spots; like the Moon she has her phases, and she moves at the rate of upwards of 80,000 miles an hour! Venus appears in the heavens the brightest of all the planets, and according as she is situated, is sometimes called the Morning, sometimes the Evening Star. What is called the transit of Venus, is the passing of this planet *over the sun's face*, which happens only twice in about one hundred and twenty years.

Next to Venus comes our *Earth*, attended by her constant companion, or satellite, the *Moon*. The diameter of the Earth may be computed to be about 7964 miles, her distance from the sun ninety-five millions of miles, and moving at the rate of 68,000 miles an hour, she completes her annual revolution in 365 days and somewhat less than six hours; all the while whirling round on her axis once in twenty-four hours with such velocity, that the inhabitants of the equator are carried round at the rate of 1042 miles, and those in the latitude of London about 644 miles in an hour.

We have already explained several of the phenomena resulting from the motion of the Earth, but there is one astronomical fact we will here mention, which may sound strange in the ears of some of our readers; viz. that we are actually nigher the sun in winter than in summer! Were it not for this, it is presumed that the severity of our winters, (being chiefly occasioned by the obliquity of the sun's rays, as they, at those seasons, fall on our atmosphere,) would be rendered still more intolerable and severe.

The magnitude of the *Moon* is said to be about one-fiftieth of that of the Earth, about which she moves at the distance of 236,847 miles, and completes her revolution in somewhat less than twenty-eight days, travelling at the rate of 2270 miles an hour.

Mars, whose diameter is little more than one half of our earth, moves next in the order of the planets: he completes his revolution in something less than 687 of our days; so that his year is nigh twice the length of ours, while his light and heat are considered to be not quite the half of what we enjoy. Mars revolves at the rate of 55,223 miles an hour, and appears in the heavens of a dusky red color.

What are called the *New Planets* are to be found betwixt the orbits of Mars and of Jupiter; but as so little is yet known respecting them, we shall just mention their names, with the dates of their discoveries;—*Ceres* was discovered by M. Piazzi in Sicily, on the 1st Jan. 1801; *Pallas* was discovered by Dr. Olbers, of Bremen, on the 28th of March, 1802; *Juno* was discovered by Mr. Harding, of Lilienthal, Bremen, 1st Sept. 1804; and *Vesta* was discovered by Dr. Olbers, 29th March, 1807. These being so very small in comparison with the others, Dr. Herschel does not deign to denominate them planets, but *Asteroids*.

But very different is the case with *Jupiter*, which is the largest of all the planets, and adorned by his belts, attended with his glorious retinue of four *moons*, comes next in order in the heavens. The magnitude of this stupendous planet is indeed said to be no less than 1400 times larger than the earth; his year is something less than twelve of ours, and he moves at the rate of 29,894 miles in an hour.—In consequence of his distance from the sun, his light and heat are computed to be only about one twenty-seventh of what the earth receives, but the former of these may be compensated by the number of his moons; by one or more of which, there is scarcely any part of this planet but what is enlightened during the whole night except his poles, and there is no saying but what has the appearance of Jupiter's belt, may be something of atmospheric nature, so constituted as to imbibe, and considerably increase, the heat of the sun's rays. Jupiter in the heavens appears to the eye next in magnitude to Venus.

Beyond the orbit of Jupiter, moves *Saturn*, attended by a retinue of no less than seven satellites or moons, and having his body surrounded by an interior and exterior ring. Although the diameter of this planet is not so large as Jupiter, his magnitude is said to be no less than 966 times that of the earth, and moving at the rate of 22,072 miles in an hour, he completes the revolution of his vide circle in a period not much less than thirty of our years!

The light and heat which he receives from the sun are computed to be about $\frac{1}{100}$ part of what the earth receives, but to compensate for this, besides the rings and moons already mentioned, the disc of this planet has been observed to be crossed by zones or belts, which may be analogous to, and answer the purposes of those of Jupiter. Saturn is visible to the naked eye, and shines in the heavens with a pale feeble light.

The *Georgian*, or *Georgium Sidus* is the remotest of all the planets yet discovered, and was brought to notice so recently as the 13th of March, 1781, by that indefatigable astronomer, Dr. Herschel. Six satellites have already been discovered attending on this distant planet. Its magnitude is supposed to be upwards of eighty times that of the earth, and its periodical revolution performed in something more than eighty three of our years. Through a telescope of a small magnifying power, the *Georgian* appears like a star of the sixth or seventh magnitude, and is only visible to the naked eye in the absence of the moon in a clear night.

These planets, with their attendant satellites and other appendages, are carried round the sun in elliptical orbits, differing but little from circles, by which means the temperature of their seasons must be wisely proportioned, and pretty equally kept up. To prevent too frequent eclipses, they move not in the same planes; and that they may not interfere with each other, they revolve all in the same direction *from the east away westerly*. The greater part of them are known, and the whole are supposed to turn round on their axis in the same manner that our earth does, by which means they must also be favored with the alternate succession of day and night; and as the revolution of the satellites of Jupiter is known to a nicety, there can be no doubt, but those planets which have such attendants, are equally benefitted by them. Of the spots of Venus and of Mars, the belts of Jupiter and rings of Saturn, we can say little; but let it be remembered, that we are surrounded by an atmosphere, the appearance of which may not easily be accounted for by the inhabitants of those distant bodies. That the planets are inhabited, we have every reason to believe, from the provision that is made for their comfort, and other analogy they bear to our own inhabited globe. It is true, that our views and discoveries respecting those distant orbs, must be imperfect and limited in this present state; but what we know not now, we may perhaps know hereafter; although it is not to be supposed, that our finite capacities even in a more exalted state and enlarged sphere of vision, shall ever be able fully to comprehend the mighty works of the Creator of the Universe, or utter forth all HIS praise.

EDUCATION.

Do you ask what will educate your son? Your example will educate him; your conversation with your friends, the business he sees you transact; the likeings you express; these will educate him; the society you live in will educate him; your domestics will educate him; above all your rank and situation in life, your house, your table, your pleasure grounds, your stables will educate him. It is not in your power to withdraw him from the continual influence of those things, except you were to withdraw yourselves from them also.

There is nothing which has so little share in education as precept. To be convinced of this, we need only reflect that there is no one point we labor more to establish with children than that of their speaking the truth; and there is not any in which we succeed worse. And why? Because children readily see we have an interest in it. Their speaking truth is used by us as an engine of government.

'Tell me, my dear child, when you have broken any thing, and I will not be angry with you.' 'Thank you for nothing,' says the child; 'if I prevent you from finding out, I am sure you will not be angry;' and nine times out of ten he can prevent it. He knows, that in the common intercourse of life you tell a thousand falsehoods.

I do not mean to assert that sentiments inculcated in education have no influence—they have much, though not the most; but it is the sentiments we let drop occasionally in the conversation they overhear when playing unnoticed in a corner of the room, which has an effect upon children; and not what is addressed directly to them in the tone of exhortation. If you would know precisely the effect these set discourses have upon your child, be pleased to reflect upon that which a discourse from the pulpit has upon you. Children have almost an intuitive discernment between the maxims you bring forward for their use, and those by which you direct your own conduct. Be as cunning as you will, they are always more cunning than you. Every child knows whom his father and mother love and see with pleasure, and whom they dislike; for whom they think themselves obliged to set out their best plate and china; whom they think it an honor to visit, and upon whom they confer honor by admitting them to their company.

'Respect nothing so much as virtue,' says Eugenio to his son; virtue and talent are the only grounds of distinction. The child presently has to inquire why his father pulls off his hat to some people and not to others; he is told that outward respect must be proportioned to different stations in life. This is a little difficult of comprehension; however, by dint of explanation, he gets over it tolerably well. But he sees his father's house in the bustle and hurry of preparation, common business laid aside, every body in movement, an unusual anxiety to please and to shine; no body is at leisure to receive his caresses or attend to his questions—his lessons are interrupted, his hours deranged. At length a guest arrives; it is my Lord ——, whom he has heard you speak of twenty times, as one of the most worthless characters upon earth. Your child, Eugenio, has received a lesson of education. Resume, if you will, your system of morality on the morrow; you will in vain attempt to eradicate it. 'You expect company, mamma, must I be dressed today?' 'No, it is only good Mr. Such-an-one.' Your child has received a lesson of education, one which he will understand and long remember.—[*Troy Press.*

MACHINE FOR MAKING PINS.

SOME further reflections are suggested by the preceding analysis, but it may be convenient previously to place before the reader a brief description of a machine for making pins, invented by an American. It is highly ingenious in point of contrivance, and, in respect to its economical principles, will furnish a strong and interesting contrast with the manufacture of pins by the human hand. In this machine, a coil of brass wire is placed on an axis, one end of this wire is drawn by a pair of rollers through a small hole in a plate of steel, and is held there by forceps. As soon as the machine is put in motion:

1. The forceps draws the wire on to a distance equal in length to one pin; a cutting edge of steel then descends close to the hole through which the wire entered, and severs a piece equal in length to one pin.

2. The forceps holding the wire moves on until it brings the wire into the centre of the chuck of a small lathe, which opens to receive it. Whilst the forceps returns to fetch another piece of wire the lathe revolves rapidly, and grinds the projecting end of the wire upon a steel mill which advances towards it.

3. After this first, or coarse pointing, the lathe stops and another forceps takes hold of the half pointed pin, (which is instantly relieved by the opening of the chuck) and conveys it to a similar chuck of another lathe, which receives it, and finishes the pointing on a finer steel mill.

4. This mill again stops, and another forceps removes the pointed pin into a pair of strong steel clamps, having small grooves in them by which they hold the pin very firmly. A part of this groove, which terminates at that edge of the steel clamps which is intended to form the head of the pin, is made conical. A small round steel punch is now driven forcibly against the end of the wire thus clamped, and the head of the pin is partially formed by pressing the wire into the conical cavity.

5. Another pair of forceps now removes the pin to another pair of clamps, and the head of the pin is completed by a blow from a second punch, the end of which is slightly concave. Each pair of forceps returns as soon as it has delivered its burthen; and thus there are always five pieces of wire at the same moment in different stages of advance towards a finished pin. The pins so formed are received into a tray, and whitened, and prepared in the usual manner.

About sixty pins can thus be made by this machine in one minute; but each process occupies exactly the same time in performing.

MEDICAL STATISTICS OF BOSTON.—The March number of the Medical Magazine contains a highly interesting communication from Dr. D. Humphreys Storer, in regard to the bills of mortality for Boston, during the nineteen years ending January 1, 1832.

The whole number of deaths for that period is 21,122. Consumption stands at the head of the list. The largest number of deaths by this disease was in 1824, viz. 244—the least number in 1818. Dyspepsia, once so fashionable a complaint, seems now to be exploded. During the last four years, not a single case is recorded.

The whole number of cases of suicide for nineteen years is 90. The largest number in any one year was 12, in 1830, when there was a general depression of business.

The bill of mortality for the years 1813, 1814, and 1815, is unpolluted, says Dr. Storer, by a death from drunkenness. Now five diseases only take precedence of this pestilence. No physician, however, in making his observations upon this table of mortality, has a fair criterion of the real state of the pestilence in question. In the various forms of fevers—the inflammations and diseases of the various organs—in convulsions, apoplexy, palsy, insanity, suicide, epilepsy,—in the great scourge of our country, pulmonary consumption—in premature decay, and sinking age, he sees the effects of the destroyer; and feels conscious that consumption alone claims more victims to its power.

But 14 cases of small pox have proved fatal during the last nineteen years. In this period 14 years have been entirely exempt—and the highest number of deaths during the remaining five years has been 4 in 1815 and 1821.

The greatest number of cases of asthma has been two in 1822, '24, '25, '27, and '31. Total 15.

The whole number of deaths from apoplexy is 199—the cases vary from 16, the highest number any one year, to 3, the lowest.

The largest number of deaths from insanity took place in 1825, being 10. During three years of the series, no death took place. Whole number 44.

QUESTIONS

ON LYCEUM NO. 34.

WHICH has been found most effectual in subduing the violent tempers of children in an Infant School of neglected children, mild or harsh treatment?

Has the progress of Lyceums been greater or less the last than preceding years?

What new modes of operation among Lyceums have occurred within the last year?

Do any Lyceums make benevolence, or DOING GOOD, a prominent object?

In what objects has the Massachusetts Lyceum concluded to cooperate with the National Society?

What distinction is made by Dr. Cazar between passions, emotions, and affections?

Is the lunar rainbow of frequent or rare occurrence?

What says a correspondent respecting the use of apparatus in schools?

How many bones in the arm, between the shoulder and elbow?

How many between the elbow and wrist?

In the wrist how many? Also, in the fingers and thumb?

How many kinds of joints in our limbs?

What kind of joint is at the elbow?

What kind of joint is at the shoulder?

How are joints secured, or fastened together?

What keeps the bones of joints from rubbing against each other?

What makes them move easy?

How many clear days in Savannah, Geo., in February last?

How many rainy? How many cloudy?

What two prominent principles in the solar system are essential to the harmony and uses of the various bodies which compose it?

What keeps the planets from flying off in tangents?

What keeps them from falling on the sun?

If the earth had no motion on its axis, how much of it would ever have the light or heat of the sun?

How many motions have the moons of the several planets? How many has the sun?

What proportion does the sea bear to the land upon the earth?

How many different species of plants have been discovered by botanists?

How large have meteoric stones been known?

What different theories have been advanced respecting the origin of these stones?

What instruments are used in cutting glass, and what substances for polishing it after it is cast?